

FINAL DRAFT: PART II

Coastal Natural Resources Report

Report to the Governor and the 68th Legislature:

**Issues not Resolved by the
Natural Resources Policy Advisory Committee and
Referred to Council for Consideration**

by the

Texas Energy and Natural Resources Advisory Council

June 1982

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This final draft is provided for review by the Texas Energy and Natural Resources Advisory Council at its June 9, 1982 meeting. Until such time as this report is formally approved by the Council, it is not to be cited as an official TENRAC publication.

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INTRODUCTION

As is noted in the introduction of Part I of this final draft of TENRAC's Coastal Natural Resources Report, the Natural Resources Policy Advisory Committee was unable to reach a consensus either in favor of or in opposition to the recommendations contained in the Wetlands and Dunes sections of this report. The Committee has elected to forward these sections of the report to the Council for discussion and further instruction. To facilitate the Council's consideration of these sections, they are being printed under separate cover.

Each of the recommendations contained in the Wetlands and Dunes sections of the draft report contemplates a role for the state in the management of privately owned lands. This state role consists of three types of activity: governmental entry into the marketplace in the form of economic incentive, public acquisition of certain lands, and governmental regulation. These recommendations propose the involvement of state government in decisions concerning the use of privately owned lands as a means of better securing the public's interest in these lands. At the same time, they seek to maintain existing protections of the landowner's right to determine the uses to which his land will be devoted.

Keeping this background in mind, a summary of the recommendations contained in the Wetlands and Dunes sections of the draft report follows.

SUMMARY OF RECOMMENDATIONS

Wetlands

1. The Texas Legislature should study the use of economic incentives to private owners of coastal wetlands as an alternative to regulatory control to preserve the natural values of these areas.

2. The General Land Office should identify coastal wetlands whose acquisition is a high priority, and the Legislature should consider funding the acquisition of these wetlands in light of the state's overall budget priorities.

3. The Legislature should recognize that the certification and acquisition of coastal wetlands is an on-going process, and it should continue to fund the related activities of the General Land Office and the Texas Parks and Wildlife Department.

4. The Legislature should alter the definition of "coastal wetlands" used in the Coastal Wetland Acquisition Act so that valuable brackish and freshwater wetlands, identified through use of the criteria already present in the Act, may be acquired, and should require that the same protections accorded private landowners in the present Act shall apply when such wetlands are acquired.

5. The Legislature should clarify the fact that the degree to which a coastal wetland is in danger of being altered, damaged or destroyed, and the imminence of that danger, relates only to the assigning of a priority for acquisition and does not relate to the certification of wetlands essential to the public interest.

6. The state of Texas should continue to seek delegation of federal authority under Section 402 of the Clean Water Act.

7. If Section 404 of the Clean Water Act is not amended, the state should not change its existing policies concerning the regulation of discharges of dredged

and fill material into state waters. If Section 404 is amended, the state should review the nature of the amendments and respond in accordance with existing state policy.

Dunes

1. The Legislature should amend the Dune Protection Act to require counties to establish a dune protection line and to implement a permitting procedure for activities within the designated dune areas.

2. The Legislature should expand the Dune Protection Act to cover the entire Gulf of Mexico shoreline, and all geographic exclusions should be removed from the Act.

3. The Legislature should clarify that the county commissioners court has the authority to adopt a dune protection line for the county's entire Gulf shoreline, including those areas in incorporated cities.

4. The Legislature should eliminate the distinction between the standards applicable to areas north of Aransas Pass and those south of Aransas Pass by prohibiting any unpermitted activity that may damage, destroy, or remove a dune or kill, destroy, or remove any vegetation growing on a dune.

WETLANDS

Wetlands are generally considered to be among the Texas coast's most valuable natural resources. Widely regarded as a vital component of the coastal environment, wetlands may be described as "...lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface."¹ Wetlands are also areas that are frequently called upon to support human activities such as waterfowl hunting, commercial and sport fishing, recreation, mineral production, agriculture, livestock grazing and navigation. The recognized importance of these areas and the potential for conflicts between the varying uses that may be made of them have led to significant public involvement in wetlands management.

Texas does not have a single, clearly articulated policy concerning wetlands management, however. Instead, state law contains various relevant expressions of policy regarding wetlands and other natural areas. These expressions of state policy are found primarily in the Texas Constitution, the Texas Water Code, and the Texas Natural Resources Code.

In 1917, Article 16, Section 59 was added to the Texas Constitution. Often referred to as the "conservation amendment", this section declares the conservation and development of the state's natural resources to be public rights and duties. While recognizing the need to conserve and preserve the natural resources of Texas, Section 50 expressly identifies the reclamation and drainage of overflowed lands as a part of the state's natural resources management program.²

Like the Constitution, the Texas Water Code recognizes the reclamation and drainage of the state's overflowed lands to be a part of the public policy concerning natural resources.³ However, the Water Code also recognizes the maintenance of

a proper ecological environment in the bays and estuaries of Texas to be an equally important component of this public policy.³ It further sets out the state's policy to maintain the quality of water in the state consistent with the public health and enjoyment, the propagation and protection of terrestrial and aquatic life, the operation of existing industries, and the economic development of the state.⁴

Finally, the Texas Natural Resources Code identifies certain policies that are important in the management of state-owned lands in the coastal area. The general policy section of the Coastal Public Lands Management Act of 1973 (codified as Texas Natural Resources Code Chapter 33) declares it to be the policy of the state to preserve the natural resources of the surface estate in these lands, including their value in a natural state.⁵ The Coastal Wetland Acquisition Act, also a part of Chapter 33, recognizes it to be the state's policy to acquire and protect coastal wetlands that are essential to the public interest and to manage these areas in a manner that will preserve and protect their productivity and integrity.⁶ However, the Act also provides that the rules and regulations governing lands acquired under its provisions must include provisions for mineral exploration, development, and production,⁷ and it exempts those wetlands used only for farming and ranching activities from acquisition by condemnation.

It might be argued that these various policy statements, when viewed collectively, constitute a policy of "multiple use" of wetlands. Such a statement is correct only if it is considered in its broadest terms. Clearly, Texas law does not support a categorical presumption favoring either development or preservation of wetlands in general. However, it is equally clear that specific wetland areas may not be able to accommodate all of the uses implicit in these policy statements. For example, draining a wetland is inherently inconsistent with maintaining the natural integrity of that area. Similarly, preservation of a wetland area that has little or no value in its natural state may unnecessarily prevent other beneficial uses of that

land. It appears instead that Texas law anticipates that decisions concerning the proper use of wetlands will be made on a "wetland-by-wetland" basis, giving equal consideration to the wetland's natural value and to the contribution that development of the area can make. If a wetland area can accommodate a number of uses, "multiple use" is appropriate. If the proposed uses of a wetland are inconsistent with one another, however, these uses must be ranked in terms of their importance to the state. Since such a ranking necessarily depends upon the resolution of various factual issues unique to the area and activity in question, it is not advisable to attempt a "once-for-all" ranking of uses.

This "wetland-by-wetland" approach to wetlands management is preferable for several reasons. Initially, it must be recognized that not all wetlands function in the same way. In general terms, a wetland provides habitat and nutrient materials for wildlife and marine life, serves as a natural storm buffer for inland areas, and filters inflows to bays and estuaries to remove fine sediments and pollutants.⁸ It is, however, difficult to quantify the extent to which these functions are performed by a specific wetland area. Some wetlands are simply more valuable in their natural state than others. The Coastal Wetland Acquisition Act, for example, recognizes this fact by providing for state acquisition of only those wetlands certified as essential to the public interest.⁹

Secondly, it is sometimes difficult to precisely define a wetland. It has been observed that there is no single, correct, indisputable, ecologically sound definition of wetlands.¹⁰ The definition used in any specific instance will usually reflect the reasons or needs requiring it. It may be based on considerations of the biological, hydrological, and/or chemical characteristics of the wetland, or it may focus on the function of the wetland in terms of the larger coastal system. Consequently, it is perhaps impossible to put forward a definition of wetlands that is appropriate in every case.

Finally, not all human activities affect wetlands in the same way.¹¹ The filling of a wetland obviously destroys its natural function as a part of the coastal environment. Other activities may only marginally inhibit this function, if at all. Once again, decisions concerning the acceptability of an activity in a defined wetland area must be case specific, taking into consideration both the value of the wetland and the need for the activity.

Drawing back for a moment from problems associated with specific wetland areas, available research does indicate that the state's wetlands system is of great importance. For example, it has been estimated that over 90 percent of the commercial and 70 percent of the recreational fisheries catch are dependent on wetlands.¹² The estimated value of the state's commercial catch in 1979 was \$172.3 million,¹³ and the contribution to the state's economy of the recreational finfish catch in that same year has been estimated to be \$700 million.¹⁴

Wetlands also provide important habitat for segments of the state's waterfowl population. During the 1975-1977 Texas Coast mid-winter waterfowl counts, about 51 percent of the ducks and 58 percent of the geese were surveyed in marshes and bays.¹⁵ The U.S. Fish and Wildlife Service has also stated that endangered whooping cranes wintering on Matagorda Island feed in wetlands on the mainland side of the island.¹⁶

The Texas Energy and Natural Resources Advisory Council recognized the significance of wetlands in a resolution adopted March 12, 1981. The resolution states that coastal wetlands are of critical importance to the state's economy and environment. In furtherance of the policy expressed in this resolution, TENRAC will undertake a study on coastal wetlands use, giving special attention to the economic value of coastal wetlands in a natural state.¹⁷

Activities in wetlands are addressed under a number of state laws. Discharges of wastes and other pollutants into wetlands are regulated under Texas

Water Code Chapter 26. The Texas Parks and Wildlife Department also has certain non-regulatory responsibilities involving wetlands as areas vital to wildlife and marine life. State-owned wetlands are managed by the General Land Office and the School Land Board under the provisions of the Texas Natural Resources Code. Wetlands management was also an important element of the now-abandoned state efforts to develop a program under the Coastal Zone Management Act.¹⁸

It is difficult to monitor the effectiveness of the state's wetlands management efforts since current information concerning changes in the extent and composition of Texas wetlands is frequently lacking. The last comprehensive inventory of alterations to Texas wetlands was done in 1966,¹⁹ and any changes in these areas are difficult to measure using information available today. The Bureau of Economic Geology at the University of Texas at Austin, however, has done a detailed inventory of the amount of wetlands as a part of its Environmental Geologic Atlas of the Texas Coastal Zone. It is possible that national statistics on the current status and trends of wetland gains and losses, to be provided by the U.S. Fish and Wildlife Service in the spring of 1982,²⁰ will fill in some of these information gaps.

Despite certain deficiencies in current data concerning wetlands, several important facts are known. To begin with, it appears fairly certain that the total area of Texas coastal wetlands (defined as salt-water marsh, brackish-to-fresh-water marsh, closed brackish-water marsh, and contiguous fresh-water marsh) is approximately 400,000 acres.²¹ Additionally, human activities may cause significant wetlands loss. In Galveston Bay, for example, about 25 percent (25,000 acres) of the bay's marsh area has been lost.²² Finger canals on Galveston Island have destroyed nearly 15 percent of the island's wetlands.²³ Spoil disposal from the proposed deepening of the Corpus Christi Inner Harbor may claim 138 acres of productive wetlands along the south shore of Nueces Bay.²⁴

Of course, not all wetland loss is attributable to human activities. Erosion, subsidence, storms, hurricanes and other natural phenomena may claim significant amounts of wetlands each year. However, such natural forces can also create new wetland areas. For example, subsidence of upland areas or a rise in the level of the Gulf may lead to the creation of saturated soil conditions characteristic of wetlands.²⁵ Even if these natural forces result in a net loss of wetland area, though, this loss is aggravated by the generally uncompensated loss of wetlands due to human activities.

It is this last fact that has led to significant governmental involvement in the management of human activities in wetlands. This governmental involvement will usually take one of two forms: public acquisition or regulation. These two forms of governmental involvement, as well as the role of the private landowner, are discussed below.

Role of the Private Landowner

1. **RECOMMENDATION:** The Legislature should study the use of economic incentives to private owners of coastal wetlands as an alternative to regulatory control to preserve the natural values of these areas.

Only about 25 percent of the state's coastal wetlands are publicly owned. The remaining 75 percent that are privately owned may be used for a variety of purposes, including private wildlife refuges, agricultural production, and industrial or commercial development. Generally speaking, the property rights of the owners of these lands are limited only by prohibitions against creating nuisances or by valid governmental regulations.²⁶ Notwithstanding the private ownership of wetlands, however, these areas may still be important to the public.

Despite the fact that the general public may have a strong interest in privately owned wetlands, there is often little incentive for the owners of such

areas to maintain them in their natural state. In many instances, significant economic returns can be realized through development of these wetlands. Sometimes, the interplay of private interests involved in development of a wetland area will lead to appropriate decisions concerning the use of this natural resource. In other cases, though, these private decisions fail to reflect consideration of all of the costs of development, and thereby encourage economically irrational uses of the area. Costs that are frequently not considered are the so-called "externalities;" that is, costs that are not borne by a party involved in the private transaction. For example, consider a situation in which the owner of an undeveloped wetland and an industrial concern agree to develop that wetland as a facility site. Because development of the area may significantly affect coastal fisheries or may render other upland areas more susceptible to storm damage, the cost-benefit questions raised by this situation cannot be dealt with by private market mechanisms. The parties to the transaction will generally only consider their private costs and benefits and the public interest in the area will go unrecognized.²⁷

In its attempts to secure the consideration of such external costs in private transactions, the government has usually adopted regulatory procedures that put it in the position of balancing private interests and public costs. This approach is particularly appropriate where it is difficult to quantify these public costs and to include them in a market equation. There are, however, occasions upon which it may be more appropriate to assign values to these costs and to structure them in such a way that they take on meaning to the private parties to a transaction. One way in which this approach can be implemented is to provide economic incentives to the private owners of wetlands to preserve their natural values. At a minimum, such incentives may include reduced property taxes on natural wetland areas.

If the discussion to this point seems a bit general, it is because little research has been done into the policies involved in this approach. Texas law really doesn't

recognize the approach as a means of preserving natural areas. The use of economic incentives as a means of preserving natural areas is drawing more interest, however, and other states are beginning to study it. For example, Wisconsin is currently studying the factors influencing individuals to drain wetlands and the full range of benefits and costs of using the drained area for agriculture.²⁸ While the Texas Legislature may determine that this approach is not suited to the state, it should study the use of economic incentives to private owners of wetlands as an alternative to regulatory control to preserve the natural values of these areas.

While it is important that private landowners not be hindered in decisions concerning the proper management of their property, private market mechanisms cannot always adequately protect the public's interest in these lands since they fail to take into consideration costs that are not borne by parties to the private transaction. Governmental involvement in decisions affecting the use of these lands is necessary in order to protect the public interest and to insure consideration of all costs associated with development of coastal wetlands. Where appropriate, the government's involvement may be limited to the provision of economic incentives to private landowners to encourage them to consider public costs in their management decisions. Where these costs are extremely large or cannot be assigned an objective economic value, however, governmental involvement through acquisition or regulation will continue to be necessary.

Public Acquisition

2. RECOMMENDATION: The General Land Office should identify coastal wetlands whose acquisition is a high priority, and the Legislature should consider funding the acquisition of these wetlands in light of the state's overall budget priorities.

The public acquisition of wetlands is perhaps the most complete approach to managing the public interest in coastal wetlands. In addition to giving the public proprietary control over a wetland area, this approach avoids problems inherent in the use of the state's police powers as a means of controlling activities that might damage the resource. Since title is acquired outright and fair compensation is paid, there is no issue concerning the point at which a regulation becomes an unconstitutional taking of private property.

The attractiveness of acquisition as a wetlands management approach is illustrated by the federal government's purchases of wetlands. The federal government may acquire bird refuges and waterfowl production areas under two separate statutes: the Migratory Bird Conservation Act²⁹ and the Hunting and Conservation Stamp Tax Act (also known as the Duck Stamp Act).³⁰ State approval is required prior to the acquisition of migratory bird refuges,³¹ but it is not required for purchases of "waterfowl production areas" under the Duck Stamp Act.³²

Pursuant to these authorities, the U.S. Fish and Wildlife Service, working in conjunction with the Texas Parks and Wildlife Department and the General Land Office, has acquired 70,000 acres of Texas coastal wetlands since 1978.³³ These acquisitions have also been coordinated with the Governor's office since they have all required state approval. Secretary of the Interior James Watt has stated his commitment to continued acquisition of wetlands under these programs.³⁴

Texas policy concerning wetlands acquisition is set out in the Coastal Wetland Acquisition Act. Adopted in 1977, the act directs the General Land Office to identify coastal wetlands that are essential to the public interest. Fee title or lesser interests in these wetlands are then subject to acquisition by the Texas Parks and Wildlife Department through gift, purchase, or condemnation. Wetlands acquired under this procedure are to be managed to preserve and protect their productivity and integrity, with provision being made for activities conducted in

conjunction with mineral exploration, development and production. Wetlands used only for farming or ranching activities are exempt from condemnation under the Act.

While the Coastal Wetland Acquisition Act does establish a clear state policy favoring public acquisition of vital wetland areas, there are several problems with the Act that make the implementation of this policy less than effective.

To date, no coastal wetlands have been acquired by the state under the Coastal Wetland Acquisition Act. This failure to follow through on the commitment made in the Act is primarily due to the fact that no funds to acquire wetlands have been included in the Texas Parks and Wildlife Department's appropriations.

The veto of program funds for fiscal year 1980-81, the low priority given to wetland acquisition in state appropriations, and the failure of the state to complete work on a Texas Coastal Program have also combined to delay the certification of essential wetlands by the General Land Office. Since this certification is a necessary first step in the acquisition process, it must be accomplished if an effective wetlands acquisition program is to be undertaken. As a prelude to actual certification of essential wetlands, the General Land Office should identify coastal wetlands whose acquisition is a high priority.

Identification of essential wetlands will be a hollow accomplishment, however, unless the Texas Parks and Wildlife Department has adequate funding to acquire these areas. The Legislature should consider funding the acquisition of these wetlands in light of the state's overall budget priorities.

The foregoing recommendation presumes that the Texas Legislature is still committed to public acquisition of coastal wetlands that are essential to the public interest. In the course of its appropriations process, the Legislature may wish to re-examine this issue. Should such a re-examination lead to a change in the state's

policy concerning wetlands acquisition, that change should be clearly set forth. However, TENRAC recommends that the state continue its present commitment to wetlands acquisition.

3. RECOMMENDATION: The Legislature should recognize that the certification and acquisition of coastal wetlands is an on-going process, and it should continue to fund the related activities of the General Land Office and the Texas Parks and Wildlife Department.

If the Legislature follows through on its commitment to acquire essential wetlands, it must recognize the fact that a one-time appropriation is not adequate to protect the public's interest in these areas. Because the coast is a dynamic system, wetlands will always be changing. In addition, the size of the financial commitment to wetland acquisition is such that it must be spread out over several years. For these reasons, TENRAC recommends that the Legislature recognize that the certification and acquisition of coastal wetlands is an ongoing process, and that it continue to fund the related activities of the General Land Office and the Texas Parks and Wildlife Department.

4. RECOMMENDATION: The Legislature should alter the definition of "coastal wetlands" used in the Coastal Wetland Acquisition Act so that valuable brackish and freshwater wetlands, identified through use of the criteria already present in the Act, may be acquired, and should require that the same protections accorded private landowners in the present Act shall apply when such wetlands are acquired.

Since the Texas Parks and Wildlife Department may acquire only "coastal wetlands", the definition of this term is important to the implementation of the Coastal Wetland Acquisition Act. At present, "coastal wetlands" are defined as areas of high biologic productivity where seawater is present at times other than during storms and hurricanes.³⁵ If this definition is to be construed as assuming that only tidally-influenced saltwater wetlands are essential to the public interest,

it is incorrect. Other wetland areas, such as fresh-water wetlands on barrier islands, may provide critical habitat for waterfowl or serve in important flood control or drainage capacities. These wetlands may be every bit as essential to the public interest as tidally-influenced saltwater wetlands, but they cannot be acquired under the Act. Consequently, TENRAC recommends that the Legislature should alter the definition of "coastal wetlands" used in the Coastal Wetland Acquisition Act so that valuable brackish and freshwater wetlands, identified through use of the criteria already present in the Act, may be acquired, and should require that the same protections accorded private landowners in the present Act shall apply when such wetlands are acquired.

5. RECOMMENDATION: The Legislature should clarify the fact that the degree to which a coastal wetland is in danger of being altered, damaged or destroyed, and the imminence of that danger, relates only to the assigning of a priority for acquisition and does not relate to the certification of wetlands essential to the public interest.

Natural Resources Code Section 33.237(a) sets out the criteria that must be considered in the process of certifying coastal wetlands as essential to the public interest and establishing priorities for the acquisition of these areas. Section 33.237(a)(4) requires that the certifying agency consider the degree to which a coastal wetland is endangered and the imminence of that danger. It is not clear, however, whether this requirement relates to the certification process itself or is a factor to be considered only in assigning priorities for acquisition of essential wetlands.

The degree to which a coastal wetland is in danger of alteration or destruction does not relate to that area's importance to the public. This importance stems from the biological, geological, and/or physical characteristics of the wetland. This factor is also not legally relevant to the use of the state's powers of condemnation, since the Texas Constitution and related statutes require

only that the property acquired through condemnation be acquired for a public use.³⁶ However, it is logical that prudent use of the state's financial resources will require that a high priority be assigned to acquiring coastal wetlands that are in danger of alteration or destruction. Other essential areas can be acquired after these critical wetlands are secured. Although these considerations are probably implicit in the law as it now stands, TENRAC recommends that the Legislature clarify the fact that the degree to which a coastal wetland is in danger of being altered, damaged or destroyed, and the imminence of that danger, relates only to the assigning of a priority for acquisition and does not relate to the certification of wetlands essential to the public interest.

Regulation

In discussing the role of the private landowner in wetlands management, this report noted that private decisions concerning uses of wetland areas often fail to include consideration of all of the economic costs associated with these proposed uses. These costs, commonly known as "externalities", are not borne by the parties to the private transaction but are instead imposed on other parties or on the public in general. If private decision-makers do not take these external costs into consideration, their actions may well be economically irrational.

In some cases, a government may encourage private parties to consider the external costs of their actions. Such encouragement may take a number of forms, but it will generally try to assign to these costs a value that will have personal meaning to the parties to the transaction. It may not always be possible to resolve the issue through use of incentives, however. The external costs may be so large as to make it impossible for the government to provide adequate incentives. Similarly, these costs may not be quantifiable. In such cases, the government may choose to actually acquire the property in question, compensating the private owner for his loss.

Public acquisition of wetlands may not always be the preferred approach to managing the resource, however. If a wetland is so important as to be considered essential to the public interest, its preservation must be the principal concern governing its use. It is likely that even a marginal loss of the wetland's natural function will significantly impair the public's interests. Certain other uses of the area may be precluded for this reason. Where a wetland is considered important but may not be characterized as essential, however, it may be best to leave the area in private hands, subject to certain reasonable limitations on its use. The range of uses that may be made of the wetland will be broader, and local taxing authorities will not lose any of their tax base. In such cases, management through governmental regulation is the most appropriate way to accommodate the competing demands placed on the wetland.

The regulatory approach to wetlands management involves the designation of a public entity as the party charged with identifying the various private and public interests associated with a proposed activity and balancing these interests to secure the most appropriate use of the resource. Of course, it is well recognized that the decision of this regulatory entity may not go so far as to constitute a taking of private property without compensation.³⁷

Of all regulations affecting activities in Texas wetlands, those governing the discharge of various substances into a wetland area are perhaps the most significant. Such discharges are incidental to most activities that can take place in or near a wetland area. Certain of these discharges are currently regulated under Texas law while others are not. The remainder of this section will discuss these discharges, the current status of state and federal efforts to regulate them, and the potential need for changes in the state's approach to their regulation.

Discharge of Wastes and Other Pollutants

6. RECOMMENDATION: The state of Texas should continue to seek delegation of federal authority under Section 402 of the Clean Water Act.

The discharge of wastes and other pollutants into the state's waters, including its wetlands, can affect the chemical and biological balance of the natural system. The introduction of such discharges into a wetland may affect the area's ability to supply nutrients to the coastal environment. In extreme cases, it may also destroy the plant life in the area, thereby destroying the wetland itself. Finally, such pollutants may enter into the natural food chain and thereby impact subsequent consumers of the life forms that spawn in or inhabit such areas.

Recognizing the necessity of regulating discharges of wastes and other pollutants, the Texas Legislature has enacted laws designating the Texas Department of Water Resources as the state's principal authority in matters relating to the quality of water in the state. The Department is also directed to prevent the unauthorized discharge of such substances. The Railroad Commission is charged with the responsibility for controlling discharges and preventing pollution resulting from activities associated with the exploration, development and production of oil, gas, and geothermal resources. The Parks and Wildlife Department and the Department of Health also have certain responsibilities with respect to the protection of the state's waters.

In regulating discharges of wastes and other effluents, the state recognizes several policies. Among these policies is the goal of protecting terrestrial and aquatic life and the public health.³⁸ The Department of Health is authorized to make recommendations to the Department of Water Resources concerning the health aspects of matters relating to the quality of water in the state,³⁹ and the Parks and Wildlife Department is empowered to enforce the laws regulating discharges insofar as they affect aquatic life and wildlife.⁴⁰

The permitting programs established by the state duplicate in many respects the procedures followed by the federal government under Section 402 of the Clean Water Act (CWA).⁴¹ Although Section 402 responsibilities can be delegated to the state, Texas has not yet assumed this program. It has, however, adopted alternative versions of certain state laws that will become effective if and when the Section 402 program is delegated. Until such time as full authority under Section 402 is delegated, however, discharges of wastes and other pollutants will be regulated by both the state and the federal government.

At the present time, persons seeking permits to discharge waste and other pollutants must secure a permit from both the state and federal government. Although the state and federal governments have coordinated their permitting processes to reduce many areas of duplication, two permits are still required. State assumption of Section 402 responsibilities will eliminate the duplication that still remains in the permitting of discharges of wastes and other pollutants. For this reason, the state should continue to seek delegation of the program and should identify and resolve all impediments to such delegation, including any pending litigation.

Discharge of Dredged and Fill Material

Texas' coastal waters, particularly its bays and estuaries, are generally shallow and are not suitable for use by large ocean-going vessels. Nonetheless, the coastal economy is heavily-dependent upon waterborne transportation. The need for water access to on-shore facilities has led to reliance on dredging as the principal means of providing necessary water depths. Associated with this dredging is the disposal of large amounts of spoil. For example, it was estimated in 1976 that if all authorized new dredging work was completed in the next ten years, nearly 400,000 acre-feet of disposal space would be required to accomodate spoil from the new dredging and all maintenance dredging during that period.⁴²

The Texas coast is also an area of extensive development, and available land is at a premium. In an effort to open more land to development for commercial, industrial, residential, and recreational use, low-lying and submerged areas are sometimes filled to higher elevations. Pipeline construction and oil and gas exploration and development may also involve the discharge of dredged or fill materials. Discharges of dredged and fill materials onto state-owned lands are regulated by the General Land Office and the School Land Board.⁴³ The state does not have regulatory procedures governing the discharge of dredged and fill materials onto privately-owned lands, including wetlands, although such discharges may still significantly affect the public's interests in such areas.

At the present time, the public's interest in protecting Texas wetlands from unreasonable damage due to the disposal of dredged and fill materials is addressed under the provisions of Section 404 of the federal Clean Water Act,⁴⁴ which prohibits the discharge of dredged or fill materials into any of the nation's waters unless the discharge first secures a permit from the U.S. Army Corps of Engineers. Pursuant to this authority, the federal government exercises broad control over many activities in the Texas coastal area. With a goal of restoring and protecting the chemical, physical, and biological integrity of the nation's waters, Section 404 has become perhaps the most well known testimonial to the federal presence on the Texas coast.

In 1977, Section 404 was amended to provide for establishing state permit programs for controlling the disposal of dredged and fill materials. However, a state program established under these procedures could not extend to traditionally navigable waters and their adjacent wetlands. This exception from the permissible scope of a state program, coupled with the very demanding regulations promulgated to govern the transfer of authority from the federal government to the state, has discouraged states from pursuing assumption of Section 404 responsibility. To date, no state has been able to successfully assume this authority.

In a resolution adopted March 12, 1981, TENRAC endorsed current congressional efforts to restrict all jurisdiction under Section 404 to the traditionally-recognized navigable waters. In adopting this resolution, TENRAC also stated its commitment to protect and manage any coastal wetland areas removed from federal jurisdiction through amendments to Section 404.

The congressional action recognized in the TENRAC resolution is currently the focus of considerable attention. Briefly stated, proposed legislation would restrict the jurisdiction under Section 404 to waters seaward of the line of mean high tide, leaving it to the states to decide whether or not regulation of dredged and fill material disposal landward of that line should take place. In response to this position, several coastal states are proposing that Congress give the states more incentive to assume federal permitting responsibility under Section 404. This incentive may be provided by increasing the area subject to state assumption to include either all waters or, at the least, wetlands adjacent to navigable waters. It may also be provided by simplifying the procedures governing transfer of authority from the federal government to the state and giving the states flexibility to design programs suited to their own special circumstances. Finally, increased incentive may be provided by making funds available to the states to help support the development and implementation of these programs.

At the present time, it is unclear whether Congress will amend Section 404 at all. If it chooses to do so, the precise nature of the amendments cannot be predicted at this time. Until Congress does act, however, the discharge of dredged and fill materials into Texas wetlands will continue to be regulated by the federal government.

7. RECOMMENDATION: If Section 404 of the Clean Water Act is not amended, the state should not change its existing policies concerning the regulation of discharges of dredged and fill material into state waters. If Section 404 is amended, the state should review the nature of the amendments and respond in accordance with existing state policy.

In 1977, the Legislature set out a state policy concerning the regulation of the discharge of dredged and fill materials and the assumption of Section 404 permitting authority.⁴⁵ The Legislature stated its desire that the state regulate the discharge of dredged and fill material only if it could do so in lieu of the Corps of Engineers. In establishing this policy, the Legislature made it clear that there should be no state regulatory duplication of federal activities regarding dredged and fill material disposal.

Although this same policy statement endorsed state assumption of Section 404 permitting authority, the state has not yet sought this authority. Since the majority of Section 404 permits issued in the state concern activities taking place in waters that are not subject to state assumption, it has been deemed inadvisable to put together an entire state program to handle a very few permits. If, however, Section 404 is amended, the state should review these amendments and determine if state action is appropriate. The Legislature has stated its preference for state regulation over federal regulation, and, if the scope of a state program will be broad enough to justify the expense involved in setting it up, this policy argues for state assumption.

If Congress should approach the issue in a different way and simply restrict federal authority over dredge and fill activities to traditionally navigable waters, the state should respond in accordance with the policy set forth in the March 12, 1982 TENRAC resolution. Should the Congressional action take some other form, the state should assess the nature of any changes which are made and respond accordingly. Consequently, TENRAC recommends that if Section 404 of the Clean Water Act is not amended, the state should not change its existing policies concerning the regulation of discharges of dredged and fill material into state waters. If Section 404 is amended, the state should review the nature of the amendments and respond in accordance with existing state policy.

Outlook

Texas coastal wetlands will continue to be considered a valuable part of the state's coastal environment. The need to balance the public's interests in these areas with the rights of private landowners and other requirements of the state's coastal economy will continue to be an issue in the state, either in the context of a state or federal regulatory program or in the Texas Legislature. While future research will aid decision-makers in the discharge of their responsibilities, important policy questions remain to be answered by the state. The answers to these questions must be found in the state's overall policy for its coast.

DUNES

Dunes are mounds, ridges, or hills of sand, either bare or vegetated, which can be built, moved, or destroyed by the wind.¹ They may appear as isolated mounds, or they may be part of a complex system that contains a variety of dune types. Dunes are also a major part of a larger coastal system. In particular, dune and beach areas function together as a unit to protect the state's shoreline. The preservation of a healthy dune system also depends upon the maintenance of state beaches. Although beaches are discussed elsewhere in this report (see "Beach Access/Erosion"), it is important to note at this point that any attempt to discuss dunes without reference to beaches is necessarily arbitrary. TENRAC's recommendations concerning state beach management should be considered along with the recommendations contained in this section.

Coastal dunes function in a number of different ways. For example, a dune area may absorb the impacts of storm tides and waves, thereby reducing damage to inland areas.² In an assessment of the impacts of Hurricane Allen on South Texas, it was noted that sand dunes on barrier islands are essential to the safety of Corpus Christi during storms and hurricanes, and that sand dunes along Padre Island and Mustang Island offered some natural protection during Hurricane Allen.³ Sand carved from coastal dunes by storm waves is deposited immediately on the submerged, near-shore portion of the beach where it helps to break storm waves, thereby dissipating their energy and weakening their attack on the beachfront.⁴ Following a storm, a natural dune area will generally restore itself as new beach sand is carried to it by the wind and is trapped by dune vegetation.⁵ In this way, coastal dunes may also mitigate shoreline erosion.

The degree of protection afforded by a dune area is dependent upon a number of factors. High, stable dunes offer the best protection against storms and hurricanes and are of the greatest value in storing and supplying sand to impede erosion. Dunes of lower elevation, discontinuous dunes, or dunes not stabilized by vegetation offer less protection, but they are still important.⁶

Many birds and small animals nest, rest, or feed in dune areas, and other animals may range into them from their primary habitats.⁷ By trapping windblown sand, dunes may also prevent the filling of shallow vegetated flats in adjacent lagoons, estuaries, and bays, thereby protecting valuable spawning grounds and wintering areas.⁸

Much of the state's coastal dune area is privately owned. As discussed elsewhere in this report,* private decisions concerning the use of natural resources frequently do not include consideration of all costs associated with the proposed use. Excluded from consideration are the costs that are borne by persons who are not parties to the private transaction. Nonetheless, these costs are real costs associated with the activity, and they should be considered if the ultimate decision on resource use is to be economically rational. In some cases, private consideration of these external costs may be encouraged through the use of governmentally provided incentives. Where this approach is possible, its use should be encouraged. Where the public costs are prohibitive or are not quantifiable, however, governmental action to prevent a person from taking a benefit not paid for may be necessary.

In 1973, the Texas Legislature evidenced its recognition that coastal dunes are important and that the government has a proper role in managing their development by enacting the Dune Protection Act.⁹ In this Act, the Legislature

*See: "The Role of the Private Landowner," Wetlands section.

concluded that the barrier islands and peninsulas of Texas and the adjacent mainland areas contain a significant portion of the state's human, natural, and recreational resources; that these areas are wholly or in part protected by the coastal dune complex; that human activities in these dunes constitute serious threats to the safety of adjacent property, to public highways, to the taxable basis of adjacent property, and to the health, safety, and welfare of persons in the area; and that these dunes should therefore be protected.¹⁰

Under the Act, the commissioners court of any coastal county north of the Mansfield Ship Channel may establish a dune protection line on any barrier island or peninsula located within that county, provided that the island or peninsula is accessible by public road or common carrier ferry facility. The dune protection line may not be located more than 1000 feet landward from the Gulf of Mexico. Once a dune protection line has been established, a permit is required from the commissioners court before dunes seaward of that line may be damaged, destroyed, or removed. A permit is not required for grazing livestock, oil and gas production, and recreational activities other than the operation of a recreational vehicle. No permit may be issued for use of recreational vehicles, as defined in the Act, seaward of this line.

Activities and uses that may require permits include geophysical and other surveys; pipelines; building and road construction and construction of bulkheads and seawalls; dredging and deposition of dredged materials; and construction of jetties, groins, piers, and similar structures. In determining whether or not to grant a permit, the commissioners court must consider the height, width, and slope of the dune and the restoration of protection afforded by the new construction and the restoration of vegetation. A littoral owner aggrieved by a decision of the commissioners court may appeal the decision to the district court in the county in which the land is located. The Commissioner of the General Land Office may also

appeal any decision he determines to be a violation of the Dune Protection Act. Finally, the Commissioner may designate as "critical dune areas" any dunes included within a dune protection line that are essential to the protection of state-owned lands, shores, and submerged lands. He may review and comment upon any application for a permit within such an area. The General Land Office has adopted rules (31 TAC Sec. 15.41 et seq) establishing guidelines for assessment of these areas.

The state's experience with implementation of the Dune Protection Act indicates that, while it establishes an acceptable framework for dune protection, it is less than effective in securing the public's interest in coastal dunes. The remainder of this chapter identifies and discusses specific problems with the Dune Protection Act and recommends some potential approaches to resolving these problems.

1. **RECOMMENDATION:** The Legislature should amend the Dune Protection Act to require counties to establish a dune protection line and to implement a permitting procedure for activities within the designated dune areas.

Perhaps the greatest short-coming relating to the Dune Protection Act is the fact that few coastal counties have moved to establish dune protection lines and to regulate activities in the dunes.¹¹ Only Nueces County has made full use of the powers granted to it under the Act. Of the 18.5 miles of coastal dunes located in Nueces County, 13.5 miles are included in a dune protection area. The remaining five miles of dunes are included in state and county parks and therefore are excluded from the provisions of the Act. The General Land Office has also designated as "critical dune areas" all dunes included within the established dune protection line in Nueces County.

Galveston County has established a dune protection line running from the end of the seawall on Galveston Island to San Luis Pass. However, the line was fixed

according to a metes and bounds description and does not move as the beach erodes. Since the dune protection line was only 50 feet from the line of vegetation when established, erosion of the beach has resulted in the line now being out on the beach, in front of any dunes. Although this dune protection line does exist in a formal sense, it is ineffective in protecting valuable dune areas in the county.

Finally, Matagorda County has established a dune protection line on the Matagorda Peninsula. The county has had little occasion to implement the Act's permitting provisions, however, since activities subject to regulation under its terms are rare in the areas covered by its dune protection line.

The Legislature has found that the state's dune system is an important part of the coastal environment, and its finding is supported by research results. The need to protect these areas is therefore recognized. It is questionable, however, whether the present means of implementing the Dune Protection Act satisfies the needs articulated in state policy.

The Dune Protection Act designates the county commissioners court as the governmental body primarily responsible for implementing its terms. The character and functions of dunes vary along the coast, and the county, in consultation with the state's technical experts, is in a good position to design its regulatory program to meet any requirements unique to a given area. The flexibility inherent in this approach should be retained.

It is a mistake to assume, however, that dune protection is exclusively a county concern. In enacting the Dune Protection Act, the Legislature recognized a broad public interest in coastal dune areas. Damage from storms and hurricanes is not usually confined to coastal counties, and residents of inland areas have a very real interest in the maintenance of a healthy dune system as a first line of defense against these events. The entire state also has an interest in preventing the loss of upland areas to erosion. Finally, the taxpayers who fund state and federal

programs that assist storm-ravaged areas in their recovery have an interest in minimizing the damage caused by storms and hurricanes. The state's coastal counties have had nearly nine years in which to implement a dune protection program, and the time has come for the state to re-examine its decision to make such implementation an exclusively local question. By amending the Dune Protection Act to require that all coastal counties establish a dune protection line and implement a permitting program for activities within the designated dune areas, the Legislature will reaffirm the broader public interest in dune protection and will take a constructive step towards securing it.

2. RECOMMENDATION: The Legislature should expand the Dune Protection Act to cover the entire Gulf of Mexico shoreline, and all geographic exclusions should be removed from the Act.

At present, the area south of the Mansfield Ship Channel, mainland areas, federal and state parks, and peninsulas and barrier islands not served by a public road or ferry are excluded from the jurisdiction of the Dune Protection Act. These areas comprise approximately 80 percent of the Texas Gulf shorefront.¹²

The exclusion of the area south of Mansfield Ship Channel is based in part upon a finding included in the Dune Protection Act:

... the area bounded on the north by Mansfield Ship Channel and extending to the southern tip of South Padre Island is an area of irregular dunes, the vast majority of which are unvegetated, unstable, and migratory, and these dunes do not afford significant protection to persons and property inland from this area.¹³

More recent information, however, indicates that this finding is not completely correct. In a discussion of shoreline changes on Padre Island south of the Mansfield Channel, it is observed that sand washed offshore during storms and hurricanes and stored in the submerged nearshore zone is eventually returned to the beach through

normal wave action.¹⁴ The author goes on to observe that whether or not the beach returns to its prestorm position depends primarily on the amount of sand available.¹⁵ It is therefore a mistake to presume that just because dunes in this area provide only minimal protection from the initial impact of a storm or hurricane, they have no value at all. As repositories for sand necessary to the recovery of the area, coastal dunes on south Padre Island are important to the physical maintenance of the natural system. In this manner, they are also important to the protection of persons and property inland from this area. Such areas therefore should be a proper subject of state concern. TENRAC recommends that this geographic exclusion be removed from the Act.

This recommendation to include areas south of the Mansfield Channel in the coverage of the Dune Protection Act must be viewed in light of the earlier recommendation that counties remain responsible for implementing the provisions of the Act. Since dunes on the lower coast are not identical to dunes in other coastal areas, it is necessary to preserve the flexibility inherent in the state's present approach to dune management. Standards adopted for Willacy and Cameron Counties must reflect the unique nature of dunes in those regions so that the essential functions of these dunes are preserved.

The exclusion of dunes on mainland areas bordering on the Gulf of Mexico is probably the result of a preoccupation with barrier islands and peninsulas at the time the Dune Protection Act was passed. Where present, dunes on mainland areas fronting on the open Gulf can perform the same functions as dunes on barrier islands and peninsulas. Those dunes may be particularly important in preserving private property by mitigating the effects of shoreline erosion. For example, areas such as Surfside, Brazoria County can benefit from the presence of coastal dunes. Mainland areas excluded from the Dune Protection Act encompass nearly 20 percent of the Texas Gulf shorefront,¹⁶ and the Legislature should extend the Act's provisions to these areas.

It is clear that at the time the Legislature passed the Dune Protection Act, it believed that park areas should not be subject to county management under the Act. While the basis of this belief is not clear in the Act, it probably reflects the conclusion that such areas are already managed in such a way as to preserve the value of coastal dunes. Many park-related activities, however, may destroy or impair dune areas. Construction of park facilities and pedestrian or vehicular traffic in parks can all impair or destroy a dune system. At a more basic level, it is appropriate that a state-imposed requirement be applied to publicly owned land as well as privately owned land. Since over 20 percent of the state's Gulf shorefront is included in state and federal parks,¹⁷ protection of dunes within these areas is critical.

Finally, the exclusion of inaccessible barrier islands and peninsulas is related to factors other than those associated with the structure and function of coastal dunes. Presumably, the Legislature felt that such dune areas were not in danger of alteration or destruction. Although the pressures on dunes associated with public use are absent, activities in these areas can significantly affect the degree of protection afforded by dunes. By extending the Dune Protection Act to these publicly inaccessible areas, the Legislature will evidence its recognition of the value of dunes located there.

3. RECOMMENDATION: The Legislature should clarify that the county commissioners court has the authority to adopt a dune protection line for the county's entire Gulf shoreline, including those areas in incorporated cities.

The nature of dunes along the Texas Gulf Coast requires that a flexible approach to management of these areas be adopted. For this reason, the county commissioners court has been designated as the entity primarily responsible for implementing the Act. Some dispute has arisen, however, concerning the county's authority to establish a dune protection line within the limits of an incorporated

city, town or village. In Nueces County, the county-established dune protection line includes areas within the city limits of Corpus Christi and Port Aransas. In other areas, however, cities have resisted the establishment of a dune protection line within their jurisdictional limits. The Dune Protection Act is not clear concerning a county's authority.

TENRAC recommends that the Legislature amend the Act to expressly authorize the establishment of a county dune protection line within the limits of an incorporated city, town, or village. The desire for uniform regulation suggests that one governmental entity should administer the dune protection program throughout the county, enforcing a single set of guidelines and procedures. Dunes within a city should be protected to the same degree as dunes outside the city's limits, and county government is the most appropriate level at which to establish a program to accomplish this objective.

4. RECOMMENDATION: The Legislature should eliminate the distinction between the standards applicable to areas north of Aransas Pass and those south of Aransas Pass by prohibiting any unpermitted activity that may damage, destroy, or remove a dune or kill, destroy, or remove any vegetation growing on a dune.

Any unpermitted activity that may damage, destroy, or remove a dune or kill, destroy, or remove any vegetation growing on a dune is currently prohibited in the area north of Aransas Pass. However, a different standard is applied to areas south of Aransas Pass. A permit is required only if the activity will reduce a dune to an elevation less than that shown on the federal Special Flood Hazard Map for the area in question, and dune vegetation may not be destroyed without a permit unless provision is made for dune stabilization to maintain the dune at the aforementioned elevation. It is unclear why this distinction was made, and there are several reasons why TENRAC recommends it be removed from the Act.

Initially, any reduction in the height of a dune will reduce its effectiveness as a storm barrier and will decrease the amount of sand available to the natural system. The Special Flood Hazard Maps reflect only minimum elevations necessary for flood protection, and do not take into account other factors associated with a dune's function.

Secondly, the Special Flood Hazard Maps contain only an approximation of dune heights and do not recognize the dynamic nature of coastal dunes. Dune configurations can change frequently in response to natural forces, and these changes may not be reflected on the Special Flood Hazard Maps for some time, if at all. Consequently, the height shown on these maps may not indicate the true importance of the dune in flood protection.

Adequate protection of the state's dune system requires that any alteration in coastal dunes be examined for its effects on the protective capacity of the dunes. This examination can best take place in the context of a permitting process established under the Dune Protection Act. A categorical presumption that certain activities will not affect the dunes should be avoided, and the Legislature should therefore require the application of a single standard for determining when a permit is required. This standard should provide that a permit will be required anytime an activity affecting the dunes takes place.

Outlook

Growth will continue on the Texas coast, bringing with it ever-increasing demands on the area's natural resources. The coast will remain a hazard-prone region, and all natural defenses for lives and property must be preserved if the state is to avoid a tragic loss of life and property to storms and hurricanes. As the coast's first line of defense against these natural forces, dunes must be managed in a manner that will protect their value as a barrier and will preserve them as areas

critical to the well-being of the state. The role of these dunes in the slowing of coastal erosion must also be recognized and acknowledged through a full implementation of the state's dune protection laws.

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Dunes

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